

XXXV.—On the Genera of Mollusca, and on the Genus *Assiminia*, in particular. By Dr. J. E. GRAY, F.R.S. &c.

To the Editors of the *Annals of Natural History*.

GENTLEMEN,

I AM induced to forward the following observations, occasioned by Mr. Clark's reply to my note on the genus *Assiminia*, more on account of their general application, than as simply bearing on Mr. Clark's paper. Mr. Clark must, I think, be almost the last remaining member of the Montaguan school of British malacologists who have done so much to increase our knowledge of the Mollusca of our shores. Unfortunately, however, he is not, like most of his colleagues, satisfied simply to describe and record the structure and habits of the species falling under his own observation, but wishes, without taking the trouble to study those found in other parts of the world than our own little island, to form a system of his own; to decide on the manner in which the *Mollusca* of all the world should be arranged; to give an *ex cathedra* opinion as to the propriety and value of groups of species of which he has probably only seen a single small and perhaps aberrant example; and to determine on the validity of a specific distinction by the observation of a collection of small extent, collected in a single locality. Malacologists must, however, always be thankful for the labours of the describer of the animal of *Cæcum*, *Dentalium*, and several other interesting genera, although it may be permitted them to wish that he would not publish his descriptions until he had made up his own opinions as to the accuracy of his observations, and not correct them, and then have to correct his corrections back to his old statement, as is to be found in more than one instance in his papers and work. There can be little doubt that distinct kinds (or as we generally call them, *species*) of animals exist in nature. It is the chief occupation of a naturalist to observe the external characters, the anatomical structure and the peculiarities in the habits and manners of each of these kinds or species, and to compare them with each other, both as individuals and as collected into groups. It is equally indisputable that certain kinds, or species, have important characters in common, and it has been the custom from the earliest times to collect such kinds as have such common characters into groups, and to divide these great groups into smaller and smaller groups by such characters as are common to each; and these groups, according to their relative importance, have been called classes, orders, families, genera and subgenera; but few naturalists, I believe, regard the lower at least of these

divisions as more than assemblages formed for general convenience, and not having any absolute existence in nature. — I think this is sufficiently proved by the facts, — first, that there still exist, or have formerly existed, some species which are confessedly intermediate between two or more of all these divisions; and secondly, that species which are placed together even in the smallest groups frequently present some character which shows either an analogical or a special affinity with the species of several other groups. Naturalists have availed themselves of this method of grouping animals together for several reasons, but principally for the following purposes:—

1. To abbreviate the accounts of the different species or kinds.

2. To enable students, by the examination of a few striking characters, to discover the name of the animal under examination.

3. To enable them to show the relations which the different groups bear to each other and to the general scheme of creation.

If this course were not adopted, it would be necessary, in the description of every animal, to describe at length every characteristic of form, structure and habit, even those which are common to many thousands of kinds, instead of mentioning only those which distinguish it from the few most nearly allied to it; repeating under every species what are now condensed in the characters of the genera, families, orders and classes of animals, which are as a matter of course considered to be common to all the animals which make up each of these groups, and are understood to be present in each of the species referred to them. It is a further advantage of this system of classification by groups, that the minute attention requisite to make out the characters of these groups produces also great minuteness and nicety of observation, which otherwise might not exist. In the same manner, if this system of division did not exist, whereby to lessen the labour of discovering the name of any animal, we should have to go through the interminable operation of reading without order the full descriptions of all the animals which have ever been described, instead of first looking for the class, order, family and genus of the species, and then comparing it with the descriptions of the few species that compose the smaller groups, and are necessarily most allied to it.

It has therefore been the custom to consider that person as the best zoologist, who has been able, by the extent of his studies and the analytical power of his mind, to seize on and neatly describe the most invariable characters of the different groups of species, as by so doing he enables other naturalists to acquire with greater facility the knowledge they require; and the accuracy and minuteness of his own studies ought also to enable him

to form more correct views as to the affinities which exist between the different species of the larger and smaller groups, and thus obtain a more clear insight into the relations which the animals bear to each other and to the rest of the creation.

In proportion as the number of animals known to naturalists has increased, by the extension of the study, the more careful researches of collectors, and the more minute examinations into the structure and habits of the different kinds, the number of groups into which they have been divided (whether called genera or subgenera) have been and are continually increasing also. For if the number of species in a group is inconveniently large, the object in forming the group has been overlooked; hence a group containing 600 or 700 species is found to be of comparatively little use in Natural History, and I must consider that a naturalist who proposes to reduce well-established groups, and to refer the species to such large groups, is evidently retrograding instead of advancing scientific objects. Such considerations sufficiently prove that it is an advantage "that a genus should be restricted in the number of its species\*;" and there cannot be a doubt "that such notions are held (almost universally) by modern zoologists," although Mr. Clark may not have been "before aware" of it.

Every day's experience confirms me in the opinion which I have often expressed, that in the distinction of the larger and smaller groups of *Mollusca* the characters derived from the animal, the shell and the operculum, which all have a mutual relation to each other, are of equal value and constancy, care being taken to select such parts of them as depend on organic structure and are not liable to accidental variation. This care in selection is equally necessary in relation to the animal, as it is to the shell and operculum. Such was the idea of Lister and Adanson; but while some authors, like Lamarck, profess to arrange the *Mollusca* according to the supposed structure of the animal (but in fact took all their characters from the shell, as only so few animals were known in their time),—others, as Férussac, have declared that the form of the shell should be disregarded, and that no genus is good that is not founded on the structure of the animal. By the remark of Dr. Philippi, appended to the part quoted by Mr. Clark, he appears to have been of that opinion when he wrote the paragraph, though I believe he has since modified it; and Mr. Clark, in some of his

\* I am aware there are some genera, as *Conus* in Malacology and *Solanum* in Botany, which contain very many species; but this arises from permanent characters not having yet been found by which they may be divided, and not from any disinclination on the part of naturalists to divide them.

observations, appears to regard the shell as of minor importance, the operculum as of still less, and the dentition, because it offers many forms, as of none, in a generic point of view.

I believe these notions to have arisen from these authors not having had sufficient opportunities of studying the animals with the shells, or the operculum and teeth with them both, and of seeing how thoroughly they depend on each other, and what excellent and permanent characters they afford, both separately and in combination with each other.

For these reasons, although the ancient authority of Dr. Philippi or even any more modern authority may be quoted against me, I must persist that I cannot believe animals such as *Truncatella* and *Assiminia* should be placed together in the same group, for the following reasons:—

#### *Truncatella*

1. Has a very short foot and large lips, and walks like a "looping" caterpillar.

2. Has large eyes furnished with a broad white iris, sunk into the superior and nearly terminal point of short rectangular tentacula.

3. Has according to Dr. Philippi a "non-spiral" operculum.

4. Has an animal which, in its young state, forms a very slender elongated shell, then suddenly enlarges its diameter, and when it has increased its larger shell to a certain size, suddenly withdraws its body from the upper more slender part, forms a septum across the cavity behind it, and throws off the slender tip, leaving a truncated end.

5. The *Truncatella* live in the sea.

#### *Assiminia*

1. Has moderate-sized lips and a large foot, and walks like a *Littorina*.

2. Has moderate-sized black eyes on the top of short, nearly cylindrical tentacula.

3. Has a distinctly spiral operculum of few whorls.

4. Has an animal which forms a conical shell, which gradually increases in even proportion from its birth to its death, and always retains the shell of its young state on the tip of the older one.

5. The *Assiminia* live in rather brackish water often far from the sea.

Let it be understood, that these are peculiarities which do not belong to a single species of each genus, as Mr. Clark appears to believe, but to each of the several species which form these

groups. All the several *Truncatellæ* found in general collections of shells have these characters; and I have seen the animals of four or five species of the genus *Assiminia* from different parts of the world, and there are in collections several species of shells, which from their characters are believed to belong to the same group.

I am amused at Mr. Clark's quoting an opinion expressed by my excellent friend Dr. Philippi in 1841, as a reply to my observation in 1855. I feel assured that if he were in this country, he would be the first to repudiate such a use being made of his name. He is undoubtedly the most enlightened of the continental conchologists. Since that period he has much extended his knowledge of the animals of shells, and is now personally engaged in examining the species found on the coast of Peru; and in his most recent work he regards *Assiminia* and *Truncatella* as distinct genera belonging to different families! (See *Handbuch*, 173, 263.) Thus his latest work contradicts Mr. Clark's views instead of supporting them.

At the same time I may observe, that the mere external forms of the animals of several genera are exceedingly similar; and unless they are very particularly examined by a person well versed with their peculiarities, what prove to be important characters may easily be overlooked, especially if the animals are of a small size, such as can only be seen by the aid of a microscope. For this reason I am not inclined to place much reliance on Dr. Philippi's determination as to the animal of the species which he has referred to the genus, when he informs us that the animals are all hyaline, that the shell of one of them, *Truncatella littorina*, is three-quarters of a line in length, and the discoidal shell of the other, *T. atomus*, is scarcely a quarter of a line in diameter, and that he was obliged to magnify it sixty diameters to observe it.

I think I need only quote the various genera, to which those who have examined the animal of the only British species of *Truncatella* have referred it, viz. *Cyclostoma*, *Paludina*, and lastly *Rissoa* (to which Dr. Philippi referred it even after he had figured it), to show that naturalists who consider the animal as the only basis of a generic character, are more unstable in their opinions than those who regard the shell and operculum as of similar value in a scientific point of view. I may add, to show how comparatively imperfect was Dr. Philippi's idea of this mollusk, in the account of the animal quoted by Mr. Clark as published in 1841, and again in 1844, that he considers it necessary to point out how it differed from the terrestrial genus *Cyclostoma*, and the fluviatile *Paludina*, both belonging to very different families according to his present views.

Mr. Clark would have quoted his authorities more correctly, if he had stated,—first, that Dr. Philippi referred his third species (t. 24. f. 4) to the genus with a mark of doubt!—as he never examined the animal. It is the figure of this species which Mr. Clark thinks “may be intended to represent our *Truncatella Grayana*.” On this head it is only necessary to observe (and showing, at the same time, the dependence to be placed in Mr. Clark’s quotation of synonyma), that as Dr. Philippi found this species very frequently in the sea at Palermo, it is to be supposed that he had observed it in all its ages; and he describes “the shell as half a line high, and one-third of a line broad, subturrit, blunt, the whorls rounded, the last not ventricose”—which does not very exactly fit our *Assiminia Grayana*, as the latter lives in brackish water, often at such a distance from the sea, that, after rains, the ditches are nearly fresh—measures one-third or more of an inch in length, is of a conic shape, acute at the top, and with scarcely raised whorls, the last somewhat angular in front. I could as soon believe that the littoral *Purpura Lapillus* and the pelagic *Buccinum undatum* were the same species, as they do not differ in more important characters; and I feel assured that Mr. Clark proposes to unite in his work many species from superficial examination and incorrect comparison.

Secondly, Mr. Clark might also have stated, that Professor Forbes and Mr. Hanley have removed one of the species (*T. atomus*), which Dr. Philippi had described as belonging to the genus *Skenea*; and that Mr. Clark himself, in his “Mollusca,” p. 386, refers this species to the genus *Truncatella* with doubt! And while on this species I may observe, that I must beg to doubt the accuracy of Mr. Clark’s observation, when he states that this species, which has a circular mouth to the shell and a cylindrical body to the animal, has an “operculum which is precisely of the same grossly spiral character and sculpture as in *Truncatella Montagu* and *Truncatella littorea*”—which have an ovate mouth to the shell, and the body of the animal compressed; such a combination of characters being directly at variance with all my experience. I am assured that *T. atomus*, on the contrary, has a circular multispiral operculum like *Trochus*, which, according to Mr. Clark’s most extraordinary theory, ought to remove it from *Truncatella* to quite a different order in his sexual system of Mollusca. It is to be regretted that Mr. Clark observed the operculum of this species so superficially, when he professes to have been able to see a white pupil on the eye of a dried specimen of the animal, which animal in its entire state is scarcely a quarter of a line in diameter!

different families according to his present views.

I adduced as one of the reasons proving that *Assiminia* is not a *Truncatella*, that it had not the white pupil which Mr. Clark has shown to be one of the characters of the group; on which Mr. Clark observes, "I do not understand the logic of this; the point in question is a mere specialty; one may with as much reason say that a man with a red iris or pupil, for example an *albino*, is not of the genus Man, because he has not the usual dark or grey iris; so, it is equally absurd to infer that *A. Grayana* is not a *Truncatella*, because the white iris or pupil was not detected." Surely Mr. Clark must know the difference between an accidental *lusus*, like an *albino* man or woman, and a character common to all the specimens of a species, and all the hitherto-observed species of a group. The argument objected to may be "illogical" and "absurd," though I own that I do not think it so; but at any rate I am not answerable for its use, for in Mr. Clark's 'Mollusca,' p. 386, occurs the following passage, referring to *Truncatella atomus*: "moreover, the eyes in the dried animal are perfectly visible, and show the characteristic white pupil of what may now be safely termed its *congener*."

In explanation of Mr. Clark's pertinacity on this head, we must bear in mind that his character as a soothsayer or prophet is dependent on his proving that *Assiminia* is a *Truncatella*; for before he had seen the animal, at page 385, and again at page 521 of his 'Mollusca,' he predicts, "that when the animal is better known, it will belong to the latter genus."

This is a good illustration of what I consider one of the principal defects of Mr. Clark's work. From some important observation, or from some *à-priori* theory, he picks up a crotchet, such as that the water does not enter by the lower siphon of the Bivalves, that the teeth are not good generic characters, that all the animals with a multispiral operculum are unisexual, &c., &c.; and forthwith he proceeds to examine specimens, apparently not with the desire to discover if the idea is founded in fact, but to prove the truth of it; and it is astonishing how his power of observation appears to adapt itself to his preconceived theory, and enables him to see just what he wishes, though to other observers the facts are clearly contrary. In the same manner, it appears to me that when he reads a work, some of the observations of the author seem to take possession of his mind, and after a time he appears to forget that they are not founded on his own observations, and puts them forth as his own discoveries. Thus his new system itself is (unwittingly perhaps) only copied from the works of Blainville and Leach, and his referring the genera *Skenea* and the elongated *Cerithia*

to *Rissoa*, are derived from an observation of Lovèn, who did not, however, regard them as species of those genera, but only intended to show that an affinity existed between them, as far as the outer form of the animal was concerned.

I am, Gentlemen,

Your obedient Servant,

J. E. GRAY.

XXXVI.—*A few Remarks on the Brachiopoda.*

By THOMAS DAVIDSON, Esq., F.G.S. &c.

[With a Plate.]

1. *On the Systematic Arrangement of Recent and Fossil Brachiopoda.*

SHORTLY after the publication of the *General Introduction* to my work on 'British Fossil Brachiopoda,' to which Prof. Owen and Dr. Carpenter each contributed most valuable chapters, M. Deslongchamps and his son proposed to make a French translation of the third chapter treating especially of *Classification*, which the Linnæan Society of Normandy had in the most liberal manner offered to publish in the tenth volume of their Transactions. About the same period I received a similar offer from M. Suess and Count Marschall of Vienna with respect to a German translation. But although highly flattered by such liberal propositions, I felt that much could be done to improve the original by corrections, as well as by considerable additions, both in text and illustrations. I therefore entirely revised my English work, printed in 1853, before it went through the process of translation, and owing to the exertions of my friends, I am happy to say that both editions are now printed, and I trust will be ready for issue by the end of the present year.

As stated in my English work, we are not yet in a condition to offer a really complete and permanent classification of the numerous species composing the class; for to be able to do so effectually, one would require to be still better acquainted with the recent animals as well as with the interior of many obscure fossil species; and it is therefore of the greatest importance not to allow ourselves to be led into proposing *genera* or *subgenera* on trifling modifications or unimportant details which exist only in certain abnormal forms\*.

\* For example, the genus *Seminula* (M'Coy) is founded on the more developed state of the dental plates, while otherwise the shells in question possess all the essential characters of Lhwyd's original genus *Terebratula*.